What is claimed is :

1. A method of treating a surface of a semiconductor substrate, said surface of said semiconductor substrate including at least any one of a copper region, a copper based region and a copper alloy region, said method comprising the steps of :

carrying out an anti-corrosion treatment by exposing said surface of said semiconductor substrate to a solution containing an anti-corrosive agent ; and

forming a copper-diffusion stopper insulating film over said surface of said semiconductor substrate.

2. The method as claimed in claim 1, wherein said surface of said semiconductor substrate includes at least one of a copper interconnection, a copper based interconnection and a copper alloy interconnection which are formed in a damascene method.

3. The method as claimed in claim 1, wherein said anti-corrosion treatment is carried out in a cleaning process after a chemical mechanical polishing process is carried out to said surface of said semiconductor substrate.

4. The method as claimed in claim 1, wherein said anti-corrosion treatment is carried out subsequent to a cleaning process for removing

metal contaminations from said surface of said substrate with a cleaning solution.

5. The method as claimed in claim 4, wherein said cleaning solution comprises a carboxylic acid based cleaning solution.

6. The method as claimed in claim 1, wherein said anti-corrosion treatment is carried out at the same time as a cleaning process for removing metal contaminations from said surface of said substrate with use of a cleaning solution which is added with said anti-corrosive agent.

7. The method as claimed in claim 6, wherein said cleaning solution comprises a carboxylic acid based cleaning solution.

8. The method as claimed in claim 6, wherein said anti-corrosive agent comprises at least one of hetero-cyclic compounds and derivatives thereof.

9. The method as claimed in claim 8, wherein said anti-corrosive agent comprises at least one selected from the groups consisting of four-membered hetero-cyclic compounds having two nitrogen atoms, five-membered hetero-cyclic compounds having three nitrogen atoms, six-membered hetero-cyclic compounds having three nitrogen atoms and derivatives thereof.

10. The method as claimed in claim 9, wherein one of said four-membered hetero-cyclic compounds comprises indazole.

11. The method as claimed in claim 9, wherein a plurality of said five-membered hetero-cyclic compound comprise benzotriazole, o-tolyltriazole, m-tolyltriazole, p-tolyltriazole, carboxybenzotriazole, 1-hydroxybenzotriazole, nitrobenzotriazole, and dihydroxypropylbenzotriazole.

12. The method as claimed in claim 1, wherein said anti-corrosive agent is contained in the range of 1 ppm to 5%.

13. The method as claimed in claim 1, wherein said anti-corrosive agent comprises at least one of aromatic compounds having benzene-rings and derivatives thereof.

14. The method as claimed in claim 1, wherein said aromatic compounds having benzene-rings comprise gallic acids and tannic acids.

15. The method as claimed in claim 14, wherein at least one of gallic acids and tannic acids is contained in the range of 0.01% to 5%.

16. The method as claimed in claim 1, wherein said copper-diffusion

stopper insulating film comprises an Si_3N_4 film.

17. The method as claimed in claim 1, wherein said copper-diffusion stopper insulating film comprises an SiON film.

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18. A method of forming a semiconductor substrate having at least an interconnection made of a metal selected from the group consisting of copper, copper-based materials, and copper alloys, said method comprising the steps of :

carrying out a chemical mechanical polishing process for forming said at least interconnection in at least a groove in said semiconductor substrate ;

carrying out an anti-corrosion treatment by exposing a surface of said semiconductor substrate to a solution containing an anti-corrosive agent ; and

forming a copper-diffusion stopper insulating film over said surface of said semiconductor substrate.

19. The method as claimed in claim 18, wherein said anti-corrosion treatment is carried out in a cleaning process after a chemical mechanical polishing process is carried out to said surface of said semiconductor substrate.

20. The method as claimed in claim 18, wherein said anti-corrosion

treatment is carried out subsequent to a cleaning process for removing metal contaminations from said surface of said substrate with a cleaning solution.

21. The method as claimed in claim 20, wherein said cleaning solution comprises a carboxylic acid based cleaning solution.

22. The method as claimed in claim 18, wherein said anti-corrosion treatment is carried out at the same time as a cleaning process for removing metal contaminations from said surface of said substrate with use of a cleaning solution which is added with said anti-corrosive agent.

23. The method as claimed in claim 22, wherein said cleaning solution comprises a carboxylic acid based cleaning solution.

24. The method as claimed in claim 22, wherein said anti-corrosive agent comprises at least one of hetero-cyclic compounds and derivatives thereof.

25. The method as claimed in claim 24, wherein said anti-corrosive agent comprises at least one selected from the groups consisting of four-membered hetero-cyclic compounds having two nitrogen atoms, five-membered hetero-cyclic compounds having three nitrogen atoms, six-membered hetero-cyclic compounds having three nitrogen atoms and

derivatives thereof.

26. The method as claimed in claim 25, wherein one of said four-membered hetero-cyclic compounds comprises indazole.

27. The method as claimed in claim 25, wherein a plurality of said five-membered hetero-cyclic compound comprise benzotriazole, o-tolyltriazole, m-tolyltriazole, p-tolyltriazole, carboxybenzotriazole, 1-hydroxybenzotriazole, nitrobenzotriazole, and dihydroxypropylbenzotriazole.

28. The method as claimed in claim 18, wherein said anti-corrosive agent is contained in the range of 1 ppm to 5%.

29. The method as claimed in claim 18, wherein said anti-corrosive agent comprises at least one of aromatic compounds having benzene-rings and derivatives thereof.

30. The method as claimed in claim 18, wherein said aromatic compounds having benzene-rings comprise gallic acids and tannic acids.

31. The method as claimed in claim 30, wherein at least one of gallic acids and tannic acids is contained in the range of 0.01% to 5%.

32. The method as claimed in claim 18, wherein said copper-diffusion stopper insulating film comprises an Si_3N_4 film.

33. The method as claimed in claim 18, wherein said copper-diffusion stopper insulating film comprises an SiON film.

34. An anti-corrosive film formed on a surface of a semiconductor substrate, said surface of said semiconductor substrate including at least any one of a copper region, a copper based region and a copper alloy region,

wherein said anti-corrosive film includes at least copper and an anti-corrosive agent.

35. The anti-corrosive film as claimed in claim 34, wherein said anti-corrosive film includes at least a compound of copper and said anti-corrosive agent.

36. The anti-corrosive film as claimed in claim 35, wherein said compound is a copper-benzotriazole compound.

37. The anti-corrosive film as claimed in claim 34, wherein said surface of said semiconductor substrate includes at least one of a copper interconnection, a copper based interconnection and a copper alloy interconnection which are formed in a damascene method.

38. The anti-corrosive film as claimed in claim 34, wherein said anti-corrosive agent comprises at least one of hetero-cyclic compounds and derivatives thereof.

39. The anti-corrosive film as claimed in claim 38, wherein said anti-corrosive agent comprises at least one selected from the groups consisting of four-membered hetero-cyclic compounds having two nitrogen atoms, five-membered hetero-cyclic compounds having three nitrogen atoms, six-membered hetero-cyclic compounds having three nitrogen atoms and derivatives thereof.

40. The anti-corrosive film as claimed in claim 39, wherein one of said four-membered hetero-cyclic compounds comprises indazole.

41. The anti-corrosive film as claimed in claim 39, wherein a plurality of said five-membered hetero-cyclic compound comprise benzotriazole, o-tolyltriazole, m-tolyltriazole, p-tolyltriazole, carboxybenzotriazole, 1-hydroxybenzotriazole, nitrobenzotriazole, and dihydroxypropylbenzotriazole.

42. The anti-corrosive film as claimed in claim 34, wherein said anti-corrosive agent comprises at least one of aromatic compounds having benzene-rings and derivatives thereof.

43. The anti-corrosive film as claimed in claim 42, wherein said aromatic compounds having benzene-rings comprise gallic acids and tannic acids.

44. A semiconductor substrate having a surface which includes at least any one of a copper region, a copper based region and a copper alloy region,

wherein an anti-corrosive film extends over said surface of said semiconductor substrate, and said anti-corrosive film contains at least copper and an anti-corrosive agent.

45. The semiconductor substrate as claimed in claim 44, wherein a copper-diffusion stopper insulating film further extends over said anti-corrosive film.

46. The semiconductor substrate as claimed in claim 45, wherein said copper-diffusion stopper insulating film comprises an Si_3N_4 film.

47. The semiconductor substrate as claimed in claim 45, wherein said copper-diffusion stopper insulating film comprises an SiON film.

48. The semiconductor substrate as claimed in claim 44, wherein said anti-corrosive film includes at least a compound of copper and said

anti-corrosive agent.

49. The semiconductor substrate as claimed in claim 48, wherein said compound is a copper-benzotriazole compound.

50. The semiconductor substrate as claimed in claim 44, wherein said surface of said semiconductor substrate includes at least one of a copper interconnection, a copper based interconnection and a copper alloy interconnection which are formed in a damascene method.

51. The semiconductor substrate as claimed in claim 44, wherein said anti-corrosive agent comprises at least one of hetero-cyclic compounds and derivatives thereof.

52. The semiconductor substrate as claimed in claim 51, wherein said anti-corrosive agent comprises at least one selected from the groups consisting of four-membered hetero-cyclic compounds having two nitrogen atoms, five-membered hetero-cyclic compounds having three nitrogen atoms, six-membered hetero-cyclic compounds having three nitrogen atoms and derivatives thereof.

53. The semiconductor substrate as claimed in claim 52, wherein one of said four-membered hetero-cyclic compounds comprises indazole.

54. The semiconductor substrate as claimed in claim 52, wherein a plurality of said five-membered hetero-cyclic compound comprise benzotriazole, o-tolyltriazole, m-tolyltriazole, p-tolyltriazole, carboxybenzotriazole, 1-hydroxybenzotriazole, nitrobenzotriazole, and dihydroxypropylbenzotriazole.

55. The semiconductor substrate as claimed in claim 44, wherein said anti-corrosive agent comprises at least one of aromatic compounds having benzene-rings and derivatives thereof.

56. The semiconductor substrate as claimed in claim 55, wherein said aromatic compounds having benzene-rings comprise gallic acids and tannic acids.

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